The Initiation of Quiescent-Filament Associated Coronal Mass Ejections by Ncw Active Regions

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We will present observational evidence that the eruption of filaments and coronal mass ejections (CMEs) occur as a consequence of the destabilization of large-scale coronal arcades clue to newly emerging magnetic flux reconnecting with the pre-existing arcades.

Many scenarios have been developed concerning the initiation of CMEs. However, for the most part, these scenarios have not been strongly supported by observations. Recently a scenario in which CMEs are initiated by the eruption of new magnetic flux beneath the pre-existing closed coronal structures has been modeled by Steinolfson, who has found that many of the observed characteristics of CMEs were seen in the model calculations.

We have observationally tested the hypothesis that the eruption of quiescent filaments and associated CMEs are initiated by magnetic reconnection between the pre-CME largescale coronal structures and new, growing active regions. Both statistical studies and case studies were carried out. We have found that 2/3 of the filament-associated CMEs occurred after substantial amounts of new magnetic flux emerged in the vicinity of the filament. The new flux we studied was in the form of new active regions. Because of observational difficulties we could not test the hypothesis that the other 1/3 of the quiescent filaments errupted because of smaller amounts of newly errupting flux. The emergence of the new active regions begins a few days before the eruption and typically is still occurring at the time of the eruption, in all cases in which the new flux was oriented favorably for reconnection with the pre-existing coronal arcades; the filament was observed to erupt.

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7. 50% talk at AAS, Stanford

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10. Schedule paper after that by Martin and Feynman

11. No